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09/827,350	04/06/2001	Arie C. Scheiberlich	P 0279263 P-0177.010-US	2993

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 05/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/827,350

Applicant(s)

SCHEIBERLICH ET AL.

Examiner

Hung Henry V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed 4/23/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-15 is/are allowed.
- 6) ☒ Claim(s) 16 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyachi (U.S.Pat. 6,400,456).

With regard to claims 16-17, Miyachi discloses a scanning exposure apparatus and corresponding method comprising all basic features of the instant claims such as : a light source (1) for providing a projection beam of radiation; a reticle stage (9) for supporting a reticle (7) having a predetermined pattern formed thereon; a substrate stage (17,19-20) for supporting a substrate (15); a projection optical system (PL) for transferring the pattern formed on the reticle onto the substrate; a level sensor (AF) for measuring and generating a position signal regarding a deviation between the image plane of the imaging system and the substrate plane; a servo control system (13) responsive to the position signal and controlling the movement of the reticle and the

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substrate to a desired position ( see col.1, lines 55-61) and a time domain filter disposed between the level sensor and the servo system for filtering the position signal and wherein the filter is a low-pass filter arranged to pass components of the position signal having a spatial frequency lower than a predetermined spatial frequency (see col.4, lines 5-23; col.5, lines 60-65, or claim 2 of Miyachi). Miyachi teaches the cutoff spatial frequencies of the low-pass filter are set to values inversely proportional the width of the exposure region (16) in the scanning direction and the height (Ho) in the non-scanning direction (see col.14, lines 8-43, and lines 62 through col.15 line 15, col.16, lines 60-67) and the low-pass filter is adapted to reduce the noise components from the input focus signals to condition the signal components and a position sensor comprising an interferometric device (23) for detecting a position of the at least mask stage and the substrate stage (see col.16, lines 32-34) and the output of the sensor being supplied to the servo control system having inner control loop for processing and controlling the position of the mask stage and the substrate stage (see col.11, line 27 through col.12, line 49).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van der Werf (U.S.Pat.5,191,200) in view of Miyachi (U.S.Pat. 6,400,456).

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With respect to claims 16-17, van der Werf (fig.1) discloses an exposure apparatus for transferring a pattern formed on a mask onto a photosensitive substrate comprising substantially all of the limitations of the instant claims including a level sensor for measuring at least one of a perpendicular position and shift about at least one parallel axis of a surface of the reticle and the substrate and producing a position signal indicative thereof, and a servo system responsive to the positional signal for controlling the movement of the reticle stage and wafer stage (see fig.1). Van der Werf does not expressly disclose a time domain filter for filtering the position signal. As discussed, Miyachi teaches a time domain filter disposed between a level sensor and a servo system of an exposure apparatus for filtering the position signal and passing components of the position signal having a spatial frequency lower than a predetermined spatial frequency (see col.4, lines 5-23; col.5, lines 60-65, or claim 2 of Miyachi). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Van der Werf and Miyachi to obtain the invention as specified in claims 16-17. It would have been obvious to a skilled artisan to employ the time domain filter between the level sensor and the servo system in the device of Van der Werf, for filtering the high spatial frequency generated by unwanted movements of the stage whereby the accuracy positioning is obtained.

***Allowable Subject Matter***

5. Amended claims 1-15 are allowed.

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***Reasons for Allowance***

6. The following is an examiner's statement of reasons for allowance: amended claims 1-15 have been found to be allowable over the prior art of record since while the prior art of record teaches an exposure apparatus having where a filter is disposed between a level sensors and a servo system for filtering the positional signal but does not specifically teach filter a position signal using a filter transfer function representative of a difference between an actual measurement of the level sensor and an ideal measurement of the level sensor as recited in the instant claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Amendment/Argument***

7. Applicant's amendments filed April 23, 2003 have been entered. Applicant's amendment is sufficient in overcoming the objection to the drawings. In view of applicant's remarks and detailed description in the specification, the rejection of claim 2 under 35 U.S.C. 112, second paragraph is withdrawn. Turning to prior art rejection, amended claims 1-15 are allowed with the reasons as set forth above. Regarding newly added claims 16-17, applicant's arguments have been carefully considered but they are not found to be persuasive. Applicant argues that applied references do not teach "a time domain filter" as recited in claims 16-17; the Examiner respectfully disagrees with the applicant. As discussed in sections 2 and 4, Miyaji teaches a

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time- domain servo system (see col.2, lines 49-53; col.12, lines 20-25; col.14, lines 39-43). It would be well known by one having skill in the art that the time-domain characteristics of a servo control system are represented by the transient and the steady state responses of the system. Clearly, Miyaji teaches a filtering system, functioning connected to a sensor system for filtering the position data measured by the sensor system in the time domain (see abstract). The transfer function of the low pass filter of Miyaji is a time domain function (see fig.9). Therefore, the filter of Miyachi is "a time domain filter" as broadly claimed in the instant claims 16-17.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

hvn  
April 29, 2003

  
**HENRY HUNG NGUYEN**  
**PRIMARY EXAMINER**